REMARKS

In the Non-Final Office Action dated January 21, 2004, claims 1-20 are pending. Claims 1, 10, and 17 are independent claims from which all other claims depend therefrom. Notice that the independent claims 1, 10, and 17, as well as claim 3 have been amended. Claims 1, 3, 10, and 17 have not been amended for patentability reasons but rather for clarifications reasons.

Claims 1-3, 5-7, 9-16 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Kopischke (USPN 6,359,553) in view of Bates et al. (USPN 6,337,638).

Claims 1 and 10 are similar and will therefore be discussed together. Claim 1 recites a collision severity estimation system for an automotive vehicle. The system includes an object detection sensor that detects an object and generates an object detection signal. A controller determines motion properties including kinetic energy of the object relative to the automotive vehicle and generates an object motion signal in response to the object detection signal. The controller generates a collision severity signal indicative of a potential collision between the automotive vehicle and the object in response to the object motion signal. Claim 10 recites a method of determining motion properties of an object. The method of claim 10 also includes determining motion properties, one of which being kinetic energy of an object. The method also includes determining velocity and a visual parameter of the object, and in response thereto determining the motion properties.

The system and method of claims 1 and 10 in determining motion properties of an object, determine kinetic energy of the object. By determining kinetic energy of an object the system and method of claims 1 and 10 are better capable of determining the potential collision severity between the object and a host vehicle. Improved collision severity prediction or estimation provides

increased collision countermeasure system performance by allowing collision countermeasures to be better tailored to the particular potential collision situation, which thereby further prevents injury to vehicle occupants.

Kopischke discloses a control arrangement for minimizing the consequences of an accident. Kopischke discloses the use of environmental sensors and an evaluating unit for determining distance and rate of change in distance between a host vehicle and an object. In response to the distance and rate of change in distance, Kopischke operates a brake system and a steering system to avoid a collision. As admitted to in the Office Action, Kopischke does not mention a collision system having a device for determining motion properties of an object. The Applicant agrees. The Applicant submits that Kopischke also does not teach or suggest determining kinetic energy of an object and determining motion properties of an object in response to the velocity and a visual parameter of the object.

Bates discloses a vehicle warning system that includes detection systems for determining range and velocity of an object. The Office Action relies on Bates for the teaching of determining motion properties. Although Bates determines velocity of an object, Bates fails to teach or suggest determining kinetic energy of an object. Bates simply determines distance and relative velocity of an object, which is different then and does not provide the elements necessary to determine kinetic energy, namely mass and velocity. Thus, Kopischke and Bates alone or in combination fail to teach or suggest each and every element of claims 1 and 10, therefore, claims 1 and 10 are novel, nonobvious, and are in a condition for allowance.

Regarding claim 3, claim 3 depends from claim 1 and further recites that the motion property estimator in generating the object motion signal determines the kinetic energy or momentum of the object. The Office Action states that Bates discloses determining momentum of an object and refers to Figures 5-7, col. 2,

line 63 to col. 3, line 59 and col. 6, line 60 to col. 7, line 11. The Applicant, respectfully, submits that Bates does not disclose determining momentum of an object. To determine or estimate momentum of an object, a system needs to determine or estimate mass of the object. In Figures 5-7 of Bates, three relative position situations are illustrated for three vehicles. In Col. 2, line 63 to col. 3, line 59, distance, speed, and velocity are determined, not momentum. In Col. 6, line 60 to col. 7, line 11 distance, velocity, and closing rate are determined, not momentum. Nowhere in Bates is mass or momentum of an object estimated or determined.

Also with regards to claim 13, the Office Action states that Kopischke discloses that a controller and an object sensor may recognize whether an object is a vehicle or a person through determining shape, volume, height, and width of the object and refers to col. 4, lines 7-23. In col. 4 lines 7-23, Applicant submits that Kopischke discloses determining the shape and distance of an object, not the volume of the object and clearly not the mass of the object, which is estimated in the method of claim 13.

The Applicant further submits that since claims 2-3, 5-7, 9, and 11-16 depend from claims 1 and 10, respectively, that claims 2-3, 5-7, 9, and 11-16 are novel, nonobvious, and are in a condition for allowance for at least the same reasons as stated above with respect to claims 1 and 10.

Claims 4, 8, and 17-20 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Kopischke in view of Bates and in further view of Miller et al. (USPN 6,480,144).

The Applicant submits that since claims 4 and 8 are dependent upon claim 1, that they are novel, nonobvious, and are in a condition for allowance for at least the same reasons as stated above with respect to claim 1.

Claim 17 recites a method of performing a collision countermeasure and includes the limitations of determining velocity, a visual parameter, and mass of

an object and in response thereto determining potential collision severity and performing a collision countermeasure. As stated above, neither Kopischke nor Bates alone or in combination determine mass of an object and potential collision severity in response to that mass determination.

The Office Action relies on Miller for the teaching of a countermeasure controller in communication with various countermeasure devices and the controller determining collision severity. Although Miller may provide such disclosure, Miller, as with Kopischke and Bates, does not teach or suggest the determination of the mass of an object and the potential collision severity between a host vehicle and an object in response to that mass determination. Thus, claim 17 is also novel, nonobvious, and is in a condition for allowance.

Furthermore, since claims 18-20 depend from claim 17, they are also novel, nonobvious, and are in a condition for allowance for at least the same reasons as put forth above with respect to claim 17.

In light of the amendments and remarks, the Applicant submits that all rejections are now overcome. The Applicant has added no new matter to the application by these amendments. The application is now in condition for allowance and expeditious notice thereof is earnestly solicited. Should the Examiner have any questions or comments, she is respectfully requested to call the undersigned attorney.

Respectfully submitted,

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